

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
26 October 2000 (26.10.2000)

PCT

(10) International Publication Number  
WO 00/62830 A3

(51) International Patent Classification<sup>7</sup>: B05D 1/22, B05B 13/02, B05C 13/00, A61L 29/00, 31/00

(21) International Application Number: PCT/US00/10316

(22) International Filing Date: 18 April 2000 (18.04.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
09/293,994 19 April 1999 (19.04.1999) US  
09/551,614 17 April 2000 (17.04.2000) US

(71) Applicant: SCIMED LIFE SYSTEMS, INC. [US/US]:  
One Scimed Place, Maple Grove, MN 55311-1566 (US).

(72) Inventors: SCHWARZ, Marlene; 161 Islington Road, Newton, MA 02466 (US). MILLER, Kathleen; 93 Brookdale Circle, Shrewsbury, MA 01545 (US). KAMATH, Kalpana; 20 Silver Hill Lane, Natick, MA 01760 (US).

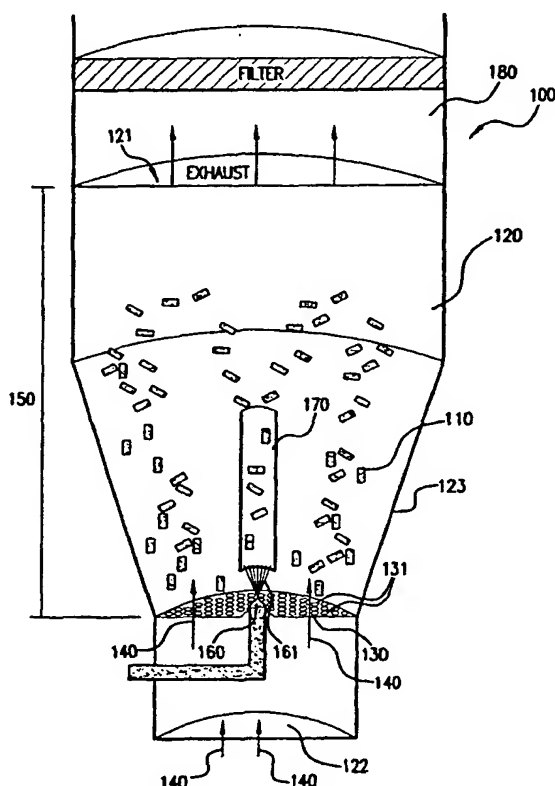
(74) Agents: BRAINARD, Charles, R. et al.; Kenyon & Kenyon, Suite 700, 1500 K Street, N.W., Washington, DC 20005 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent

[Continued on next page]

(54) Title: COATING MEDICAL DEVICES USING AIR SUSPENSION



(57) Abstract: Methods and apparatuses for coating medical devices and the devices thereby produced are disclosed. In one embodiment, the invention includes a method comprising the steps of suspending the medical device in an air stream and introducing a coating material into the air stream such that the coating material is dispersed therein and coats at least a portion of the medical device. In another embodiment, the medical devices are suspended in an air stream and a coating apparatus coats at least a portion of the medical device with a coating material. The coating apparatus may include a device that utilizes any number of alternative coating techniques for coating the medical devices. This process is used to apply one or more coating materials, simultaneously or in sequence. In certain embodiments of the invention, the coating materials include therapeutic agents, polymers, sugars, waxes, or fats. By using air suspensions to coat medical devices, the methods of the present invention result in coatings having minimal defects and uniform thicknesses and mechanical properties. Further, the methods of the present invention are time efficient and cost effective because they facilitate the coating of numerous medical devices in a single batch, resulting in numerous medical device units containing substantially the same coating.

WO 00/62830 A3



(AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

(88) Date of publication of the international search report:  
28 December 2000

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Published:**

- *With international search report.*
- *Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.*

## INTERNATIONAL SEARCH REPORT

Internat. Application No.

PCT/US 00/10316

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B05D1/22 B05B13/02 B05C13/00 A61L29/00 A61L31/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B05D B05B B05C A61L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EP0-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages                             | Relevant to claim No.  |
|------------|--|--|
| X          | US 3 089 824 A (D.E. WURSTER)<br>14 May 1963 (1963-05-14)<br><br>column 1, line 65 - line 67; example 1<br>--- | 1,2,<br>13-25,<br>27,28,<br>30,<br>36-38,<br>42,43,<br>50,51 |
| X          | US 2 648 609 A (D.E. WURSTER)<br>11 August 1953 (1953-08-11)<br><br>the whole document<br>---<br>-/--          | 1,2,16,<br>21,<br>23-25,<br>27,<br>36-38,<br>41-43,<br>50,51 |

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "&" document member of the same patent family

Date of the actual completion of the international search

11 October 2000

Date of mailing of the international search report

19/10/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx 3: 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Brothier, J-A

# INTERNATIONAL SEARCH REPORT

Internat'l Application No

PCT/US 00/10316

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No.  |
|------------|---|--|
| X          | US 4 535 006 A (NAUNAPPER DIETMAR ET AL)<br>13 August 1985 (1985-08-13)<br><br>the whole document<br>---  | 1,2,36,<br>38,<br>44-46,<br>50-57                            |
| X          | DE 33 23 418 A (GLATT GMBH)<br>3 January 1985 (1985-01-03)<br><br>the whole document<br>---   | 1,2,36,<br>38,<br>44-46,<br>50-57                            |
| X          | US 3 253 944 A (D.E.WURSTER)<br>31 May 1966 (1966-05-31)<br>cited in the application<br><br>the whole document<br>---                             | 1,2,21,<br>23-25,<br>27,<br>36-38,<br>41-43,<br>50,51        |
| X          | US 2 799 241 A (D.E. WURSTER)<br>16 July 1957 (1957-07-16)<br><br>the whole document<br>---   | 1,2,16,<br>21,<br>23-25,<br>27,<br>36-38,<br>41-43,<br>50,51 |
| A          | WO 96 17692 A (CIBA GEIGY AG ; JANSSEN<br>ROBERT ALLEN (US); HEYL BARBARA LYNN<br>(US);) 13 June 1996 (1996-06-13)<br>the whole document<br>----- | 1  |

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/10316

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s)  | Publication<br>date  |
|---|---------------------|---|--|
| US 3089824 A                              | 14-05-1963          | BE 590276 A<br>CH 391664 A<br>DK 98651 A<br>FR 1258497 A<br>GB 889098 A<br>IT 629516 A<br>NL 251030 A<br>NO 98434 A   | 28-07-1961   |
| US 2648609 A                              | 11-08-1953          | NONE  |  |
| US 4535006 A                              | 13-08-1985          | DE 3237303 A<br>JP 59090624 A   | 12-04-1984<br>25-05-1984   |
| DE 3323418 A                              | 03-01-1985          | NONE  |  |
| US 3253944 A                              | 31-05-1966          | NONE  |  |
| US 2799241 A                              | 16-07-1957          | NONE  |  |
| WO 9617692 A                              | 13-06-1996          | US 5665420 A<br>AT 169248 T<br>AU 705658 B<br>AU 4175396 A<br>BR 9509956 A<br>CA 2204129 A<br>CN 1168646 A<br>DE 69503924 D<br>DE 69503924 T<br>DK 797482 T<br>EP 0797482 A<br>ES 2119500 T<br>FI 971683 A<br>JP 10509640 T<br>NO 972547 A<br>NZ 296992 A<br>US 5824276 A | 09-09-1997<br>15-08-1998<br>27-05-1999<br>26-06-1996<br>11-11-1997<br>13-06-1996<br>24-12-1997<br>10-09-1998<br>18-03-1999<br>03-05-1999<br>01-10-1997<br>01-10-1998<br>10-07-1997<br>22-09-1998<br>04-06-1997<br>29-07-1999<br>20-10-1998 |

